
```
Select  *
        from DB_INSPIRATION
        where (Meeting = 'Finnish DB2UG'
        and Location = 'IBM Helsinki – Munkkiniemi'
        and Title = 'Performancetuning Importance and Tooling'
        and tmsp_start = '2005-04-29-12.45.00.000000'
        and tmsp_slut = '2005-04-29-13.30.00.000000')
        for update of networking
with ur;
```

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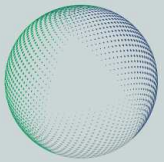
JN Data A/S – Denmark

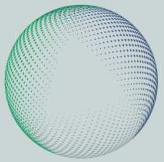
Performancetuning
Importance and tooling



JN DATA

- Who is Svenn-Aage Sønderskov
- Who is JN Data
- Performancetuning is important
- Tooling is essential
- Samples from the 3270 tool
- Strobe/Istrobe
- Visual Explain
- What is accomplished
- Questions

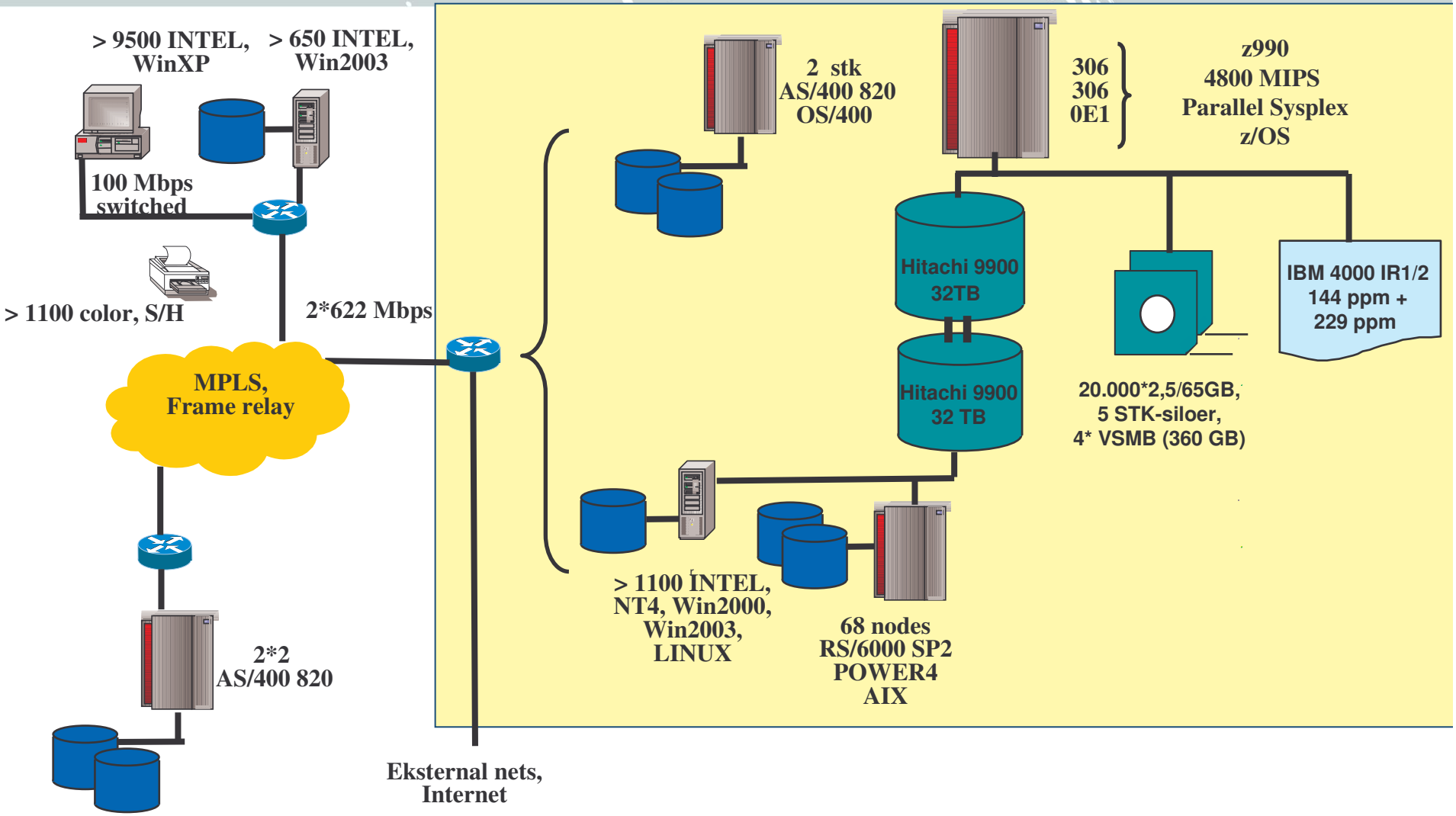
Who is Svenn-Aage Sønderskov and JN Data?



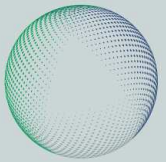
- **Svenn-Aage Sønderskov**
  - **1976 Danske Bank(Prog)**
  - **1981 BRF (DBA)**
  - **1983 Scandia (Sysprog)**
  - **1985 Jyske Bank (Sysprog CICS and DB (Total)**
  - **1986 Jyske Bank (Sysprog DB2)**
  - **1988 Jyske Bank (DBA Team Manager and Sysprog)**
  - **2002 JN Data (Teammanager)**
  - **GSE DB2 WGC chairman**
- **JN Data**
  - **2002 Nykredit and Jyske Bank**
  - **Sysprog, DBA, Operation etcc**
  - **z/OS 1.4 (1.6)**
  - **CICS 2.3 (3.1)**
  - **DB2 z/OS 7.1 (8)**
  - **18 DB2-subsystems**
    - **6 Datasharing**
  - **DB2 LUW 8.2**
  - **Oracle 8.1.7, 9.2**
  - **SQL Server 2000 Cluster**

Configuration

JN DATA



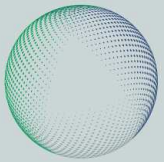
Performancetuning is important



JN DATA

- 1 CPU > 500.000 € (MLC)
- With WLC you pay by usage (Reduce unproductive usage)
- Responsetime increase reduces productivity in both business and IT-departments.
- Waste of I/O and CPU impact on BP/DB2
- Educate your developers and implement tools to help them and yourselves
- Performancetuning is a teameffort

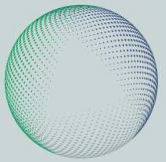
Tooling is essential



JN DATA

- **Overview**
  - **Batch-flow > 10.000 jobs**
  - **SUC/PRE > 100.000**
  - **What is ”normal” ?**
  - **Where are ressources used ?**
  - **Where are DB2-objects used ?**
  - **Is DB2 the ”bad” guy ?**
- **Tooling**
  - **Homegrown DW - CMXR**
  - **Strobe / Istrobe**
  - **Visual Explain**
  - **Incorporate clever thinking in the toolset**
  - **Administration tools (BMC Catalog Manager, Change Manager, DASD Manager, Catalog Management, FileAid, Utility Suite, TMON-suite, DSNREXX …)**
  - **Looking at IBM’s Query Monitor for Dynamic SQL**

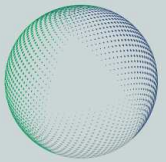
CMXR What is it?



JN DATA

- TSO/ISPF-application build with standard TSO/ISPF panels and 1 PL/I-prg (converts DB2-table to ISPF-table)
- Extracts done by standard SRCHFOR, SAS-programs, sample-routines and loaded via standard DB2 load
- Developed to help Development/Operations to find elements in order to maintain and operate the z/OS-platform
- Focal Point – Everything of interest has to be here
- Menu-driven dialog, where every question of relevance can be answered
- Alternatives: XINFO – Horizont (Germany).

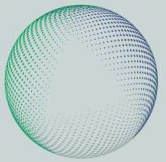
CMXR Why ?



JN DATA

- Optimizing maintenance for high quality.
- Securing overview in 1 spot in stead of a series of independant tools
- I requires an expert to find everything in a complex environment.
- Executing scan-functions is expensive and cumbersome. These are done at night as batchjobs
- Different methods for analyzing scope is source to lower quality in maintenance

CMXR Where does data come from?



JN DATA

- Source-libraries for Program/JCL-source/Xref
- Procedurelibraries (JCL-procedurer)
- TWS (Tivoli Workload Scheduler)
- ÅAVRS (SDSF-output)
- RACF (Security)
- Production Turn Oversystem
- DB2 monitor data (TMON SMF-output)
- Windows – Server/WS is build from a DB2-table
- Data is loaded on a daily basis. SE shows timestamps.

```
SD ------------------------  Catalog Management xref ------------------------
Option  ===> 10_

                                                        USERID   - UPD
                                                        TIME     - 11:49
                                                        TERMINAL - 3278
                                                        PF KEYS  - 24

Option

  1  Job-info             - (xref jcl-source)
  2  Program-info         - (xref programsource)
  3  Dependancies         - (xref jobdependancies and relations)
  4  Security             - (xref RACF)
  5  Ownership            - (xref who is responsible for what)
  6  CICS-CEDA            - (xref på CEDA-definitions)
  7  Windows Logs         - (Event log etx)
  8  Joboutput            - (Overview ÅAVRS)
  9  PC-Configuration     - (Overview PC/server-configuration)
 10  Performance          - (Overview Performancenumbers)
 SE  Status               - (When is data created)

Press PF3 to return
```

```
SD ------------------  Catalog Management X-ref - Performance  Row 1 to 1 of 1
Option  ===> 1_
                                                          USERID   - UPD
                                                          TIME     - 12:03
Name ==> DSN%                                             TERMINAL - 3278
Date ==> 2005-04-26  (Format DATE)                        PF KEYS  - 24
Sort ==> C           (C=Cpu,E=Elapstid,S=SQLcount)
Env. ==> P           (X=All,E=EDUC,P=Production,D=Development)


Option

  1  Package/day                          - Fill Name(Package)/Date
  2  Package-history                      - Fill Name (Package)
  3  Transaction/day                      - Fill Name(Transaction)/Date
  4  Transaktion/package/dato             - Fill Name(Transaction)/Date
  5  What dates do we have data from      - Press Enter
  6  Show CICS-Region/day                 - Fill Name(CICS)/Date


Press PF3 to return
******************************** Bottom of data ********************************
```

```
SD ------------------------ Forbrug pr Package pr. dato ------ Row 1 to 9 of 9
Command ===>                                                  SCROLL ===> CSR
Key     ===> DSN%.2005-04-26 Sorteret efter TOTALCPU
Cmd--> CON HIS PAH TRN
Cmd  Package    Connection     Total-CPU  Total Elaps  SQL-Count   DB2GRP
     navn       Type          (Sekunder)   (Sekunder)
     DSNREXX    DB2 CALL AT        10948        25123      42847   DSNDBP0
his_ DSNTIAUL   TSO                10657        38707   64882550   DSNDBP0
     DSNCLICS   DB2 CALL AT         3427        29188   26929847   DSNDBP0
     DSNTEP2    TSO                  533         5988    1374637   DSNDBP0
     DSNAPCOL   REMOTE UOW             0            2        262   DSNDBP0
     DSNASTAT   REMOTE UOW             0            0         44   DSNDBP0
     DSNAPRKY   REMOTE UOW             0            0         36   DSNDBP0
     DSNCLIC1   DB2 CALL AT            0            0          6   DSNDBP0
     DSNESM68   TSO                    0           10         20   DSNDBP0
******************************** Bottom of data ********************************
```

```
SD ---------------------------- Historik pr. package ------ Row 1 to 25
Command ===>                                                SCROLL ===> C
Key     ===> DSNTIAUL
Cmd--> CON TRN
```

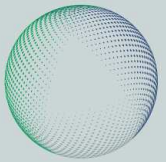
Cmd	Package navn	Connection Type	Dato	Total-CPU (sekunder)	Total Elaps (Sekunder)	SQL-Count
	DSNTIAUL	TSO	2005-04-26	10657	38707	64882550
	DSNTIAUL	TSO	2005-04-25	1018	4642	33046052
	DSNTIAUL	TSO	2005-04-24	40	82	2331299
	DSNTIAUL	TSO	2005-04-23	5	5	585557
	DSNTIAUL	TSO	2005-04-22	142	983	10632429
	DSNTIAUL	TSO	2005-04-21	1581	3824	45245913
	DSNTIAUL	TSO	2005-04-20	9980	20969	60519820
	DSNTIAUL	TSO	2005-04-19	8779	12267	97545882
	DSNTIAUL	TSO	2005-04-18	8663	16995	77855722
	DSNTIAUL	TSO	2005-04-17	80	108	2338550
	DSNTIAUL	TSO	2005-04-16	259	440	10335873
	DSNTIAUL	TSO	2005-04-15	10767	23933	203018302
	DSNTIAUL	TSO	2005-04-14	8812	13209	61142253
	DSNTIAUL	TSO	2005-04-13	11165	25926	103285708
	DSNTIAUL	TSO	2005-04-12	16412	37263	441120067
	DSNTIAUL	TSO	2005-04-11	11089	26643	104360789
	DSNTIAUL	TSO	2005-04-10	5384	19047	140258827
	DSNTIAUL	TSO	2005-04-09	256	404	10362448
	DSNTIAUL	TSO	2005-04-08	15963	31649	185588018
	DSNTIAUL	TSO	2005-04-07	8505	13952	53680466
	DSNTIAUL	TSO	2005-04-06	11965	21672	90407180
	DSNTIAUL	TSO	2005-04-05	8609	16177	63283865
	DSNTIAUL	TSO	2005-04-04	9188	15632	57351362
	DSNTIAUL	TSO	2005-04-03	82	133	2473509
	DSNTIAUL	TSO	2005-04-02	2783	4102	153677060

Cmd	Connection ID	Dato	Total-CPU (Sekunder)	Total Elaps (Sekunder)	SQL-Count
	BATCH	2002-11-23	39185	48520	1832559
	BATCH	2005-02-18	17398	43175	199342706
	BATCH	2005-04-12	16412	37263	441120067
	BATCH	2005-04-08	15963	31649	185588018
	BATCH	2005-02-11	13666	28151	189721342
	BATCH	2005-02-09	12358	31296	110990618
	BATCH	2005-03-15	11999	21491	87372615
	BATCH	2005-04-06	11965	21672	90407180
	BATCH	2005-03-07	11964	23113	46239805
	BATCH	2005-02-25	11818	25283	101150360
	BATCH	2005-02-23	11630	31046	71304375
	BATCH	2005-03-18	11273	19163	208922436
	BATCH	2005-04-13	11165	25926	103285708
	BATCH	2005-04-11	11089	26643	104360789
	BATCH	2005-03-01	11084	23169	84904001
	BATCH	2005-04-15	10767	23933	203018302
	BATCH	2005-04-26	10657	38707	64882550
	BATCH	2005-03-11	10630	17806	183387004
	BATCH	2005-03-09	10516	23667	98280113
	BATCH	2005-02-10	10251	27496	58123062
	BATCH	2005-02-22	10184	19787	78570758
	BATCH	2005-04-20	9980	20969	60519820
	BATCH	2005-03-16	9661	16878	70155165
	BATCH	2005-03-04	9563	18171	81661358
	BATCH	2005-03-08	9554	17713	78512449

```
Cmd--> = BA BRO DATA HIS KIG PIN PRE S SUC UJB ÅAV
Cmd  JOB                 Job  Step        Pgm
                         Ejer
     BODW30W0            ???  UNLOAD      DSNTIAUL
     BOG001              BOG  UNLINKT     DSNTIAUL
     BO30DC1             BOG  UNLOAD      DSNTIAUL
     BO30FP              BOG  JBFP001     DSNTIAUL
     BO30FP              BOG  JBFP011     DSNTIAUL
     BO30FP              BOG  JBFP021     DSNTIAUL
     BO30FP              BOG  JBFP031     DSNTIAUL
     BO30FP              BOG  JBFP081     DSNTIAUL
     BO30W0              ???  UNLOAD      DSNTIAUL
     BO3497              ???  JB3497UN    DSNTIAUL
     BO58U0G             BOG  UNLPRO      DSNTIAUL
     BO58U0H             BOG  UNLOAD      DSNTIAUL
     BO58U0I             BOG  UNLOAD      DSNTIAUL
     CBJTEST1            ???  UNLV5011    DSNTIAUL
     DBE0001             DBA  DANMODC     DSNTIAUL
     DBE0001             DBA  DANMODS1    DSNTIAUL
     DBE0001             DBA  DANMODS2    DSNTIAUL
     DBE0024             DBA  UNLOADLU    DSNTIAUL
     DBE0025             DBA  UNLOADLO    DSNTIAUL
     DBE0036             DBA  UNLOADLO    DSNTIAUL
     DBH0002             DBA  DANMODC     DSNTIAUL
     DBH0002             DBA  DANMODS1    DSNTIAUL
     DBH0002             DBA  DANMODS2    DSNTIAUL
     DBP0001             DBA  DANMODC     DSNTIAUL
     -------             ---  --------    --------
```

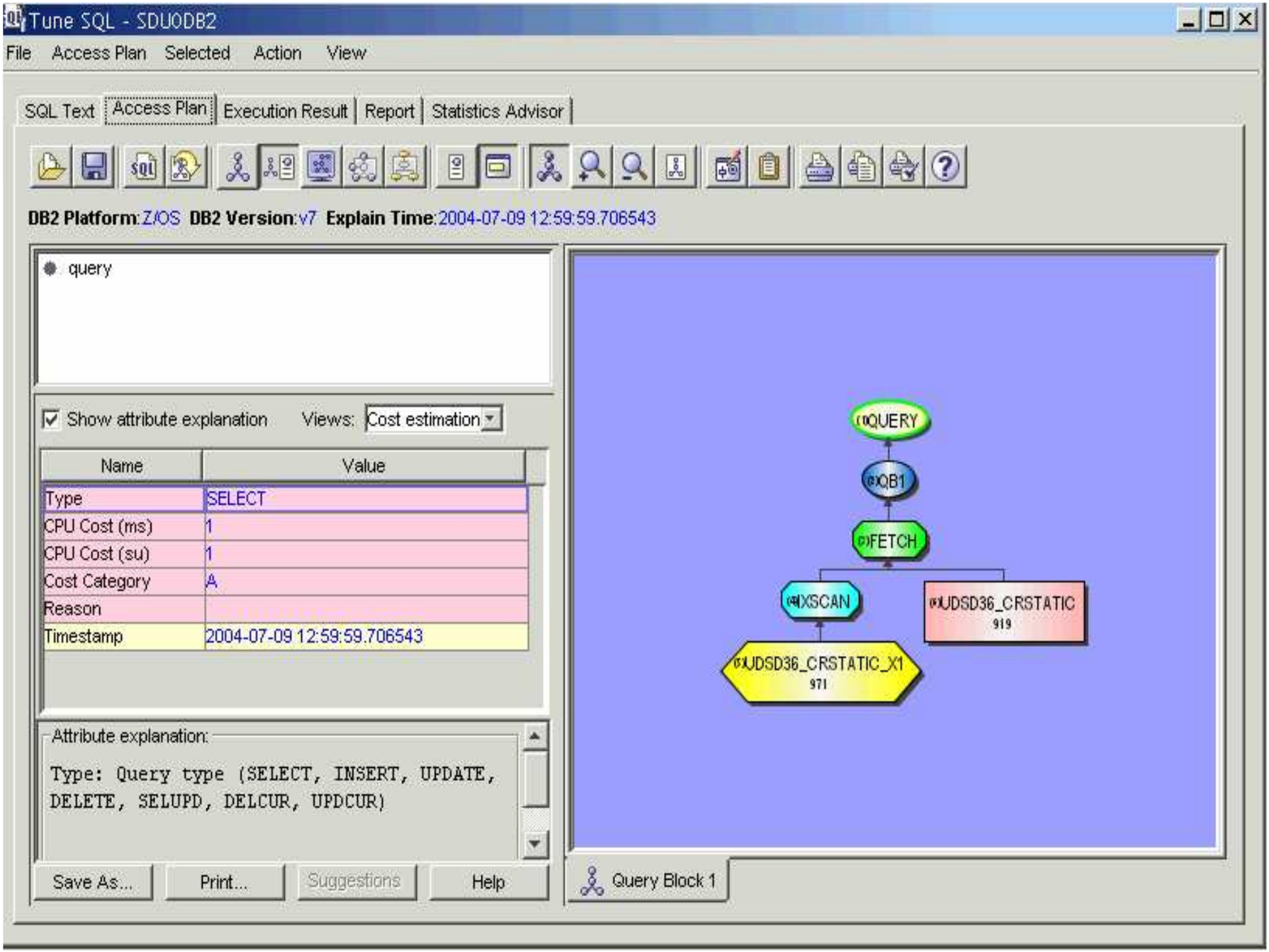
```
Cmd--> = KAL KIG LOG PRE SUC ÅAV
Cmd Job      Retur     Start-                Slut-                 Kørsels-
            kode      tid                   tid                   tid
    DBE0001  RC=0004   2005-04-25-06.07.00 2005-04-25-06.34.00         27.00
    DBE0001  RC=0004   2005-04-18-06.09.00 2005-04-18-06.59.00         50.00
    DBE0001  RC=0004   2005-04-11-07.35.00 2005-04-11-08.21.00         46.00
    DBE0001  RC=0004   2005-04-04-10.38.00 2005-04-04-11.31.00         53.00
    DBE0001  RC=0004   2005-03-29-06.59.00 2005-03-29-07.19.00         20.00
    DBE0001  JCL ERR   2005-03-29-06.09.00 2005-03-29-06.18.00          9.00
    DBE0001  RC=0004   2005-03-21-06.07.00 2005-03-21-06.33.00         26.00
    DBE0001  RC=0004   2005-03-14-06.07.00 2005-03-14-06.33.00         26.00
    DBE0001  RC=0004   2005-02-28-06.07.00 2005-02-28-06.34.00         27.00
    DBE0001  RC=0004   2005-02-21-07.06.00 2005-02-21-07.36.00         30.00
    DBE0001  RC=0004   2005-02-14-07.35.00 2005-02-14-08.04.00         29.00
    DBE0001  RC=0004   2005-02-07-06.39.00 2005-02-07-07.28.00         49.00
    DBE0001  RC=0004   2005-01-31-06.07.00 2005-01-31-06.30.00         23.00
    DBE0001  RC=0004   2005-01-24-06.29.00 2005-01-24-07.03.00         34.00
    DBE0001  RC=0004   2005-01-17-06.22.00 2005-01-17-06.53.00         31.00
    DBE0001  RC=0004   2005-01-10-06.29.00 2005-01-10-06.52.00         23.00
    DBE0001  RC=0004   2005-01-03-06.08.00 2005-01-03-06.35.00         27.00
    DBE0001  RC=0004   2004-12-27-09.52.00 2004-12-27-10.26.00         34.00
    DBE0001  S04E      2004-12-27-09.51.00 2004-12-27-09.51.00          0.00
    DBE0001  S04E      2004-12-27-09.00.00 2004-12-27-09.07.00          7.00
    DBE0001  RC=0004   2004-12-20-06.23.00 2004-12-20-06.51.00         28.00
    DBE0001  RC=0004   2004-12-13-06.11.00 2004-12-13-06.36.00         25.00
    DBE0001  RC=0004   2004-12-06-06.12.00 2004-12-06-06.44.00         32.00
    DBE0001  RC=0004   2004-11-29-06.07.00 2004-11-29-06.34.00         27.00
    DBE0001  RC=0004   2004-11-22-06.22.00 2004-11-22-06.50.00         28.00
```

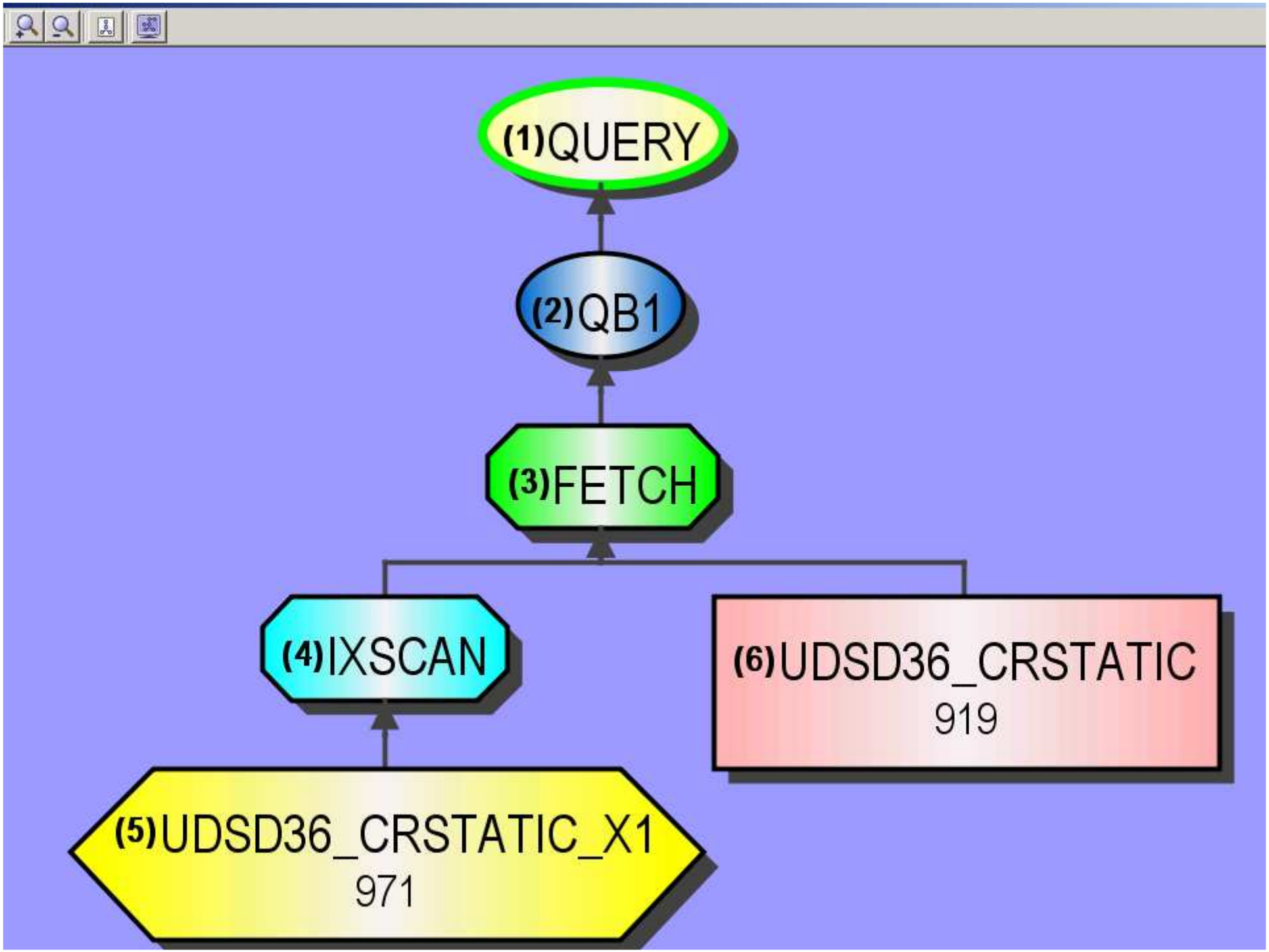
Is DB2 the ”bad” guy

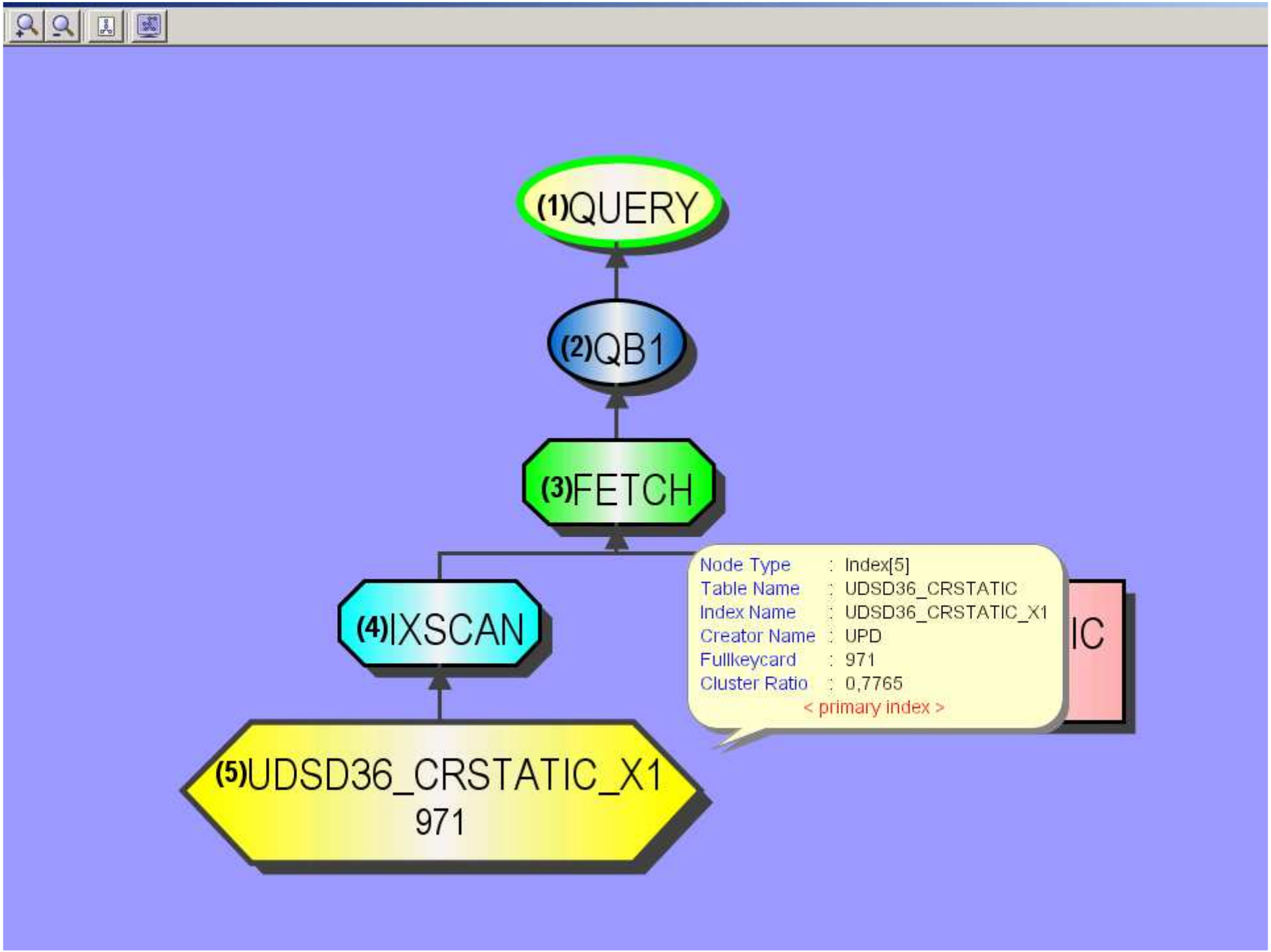


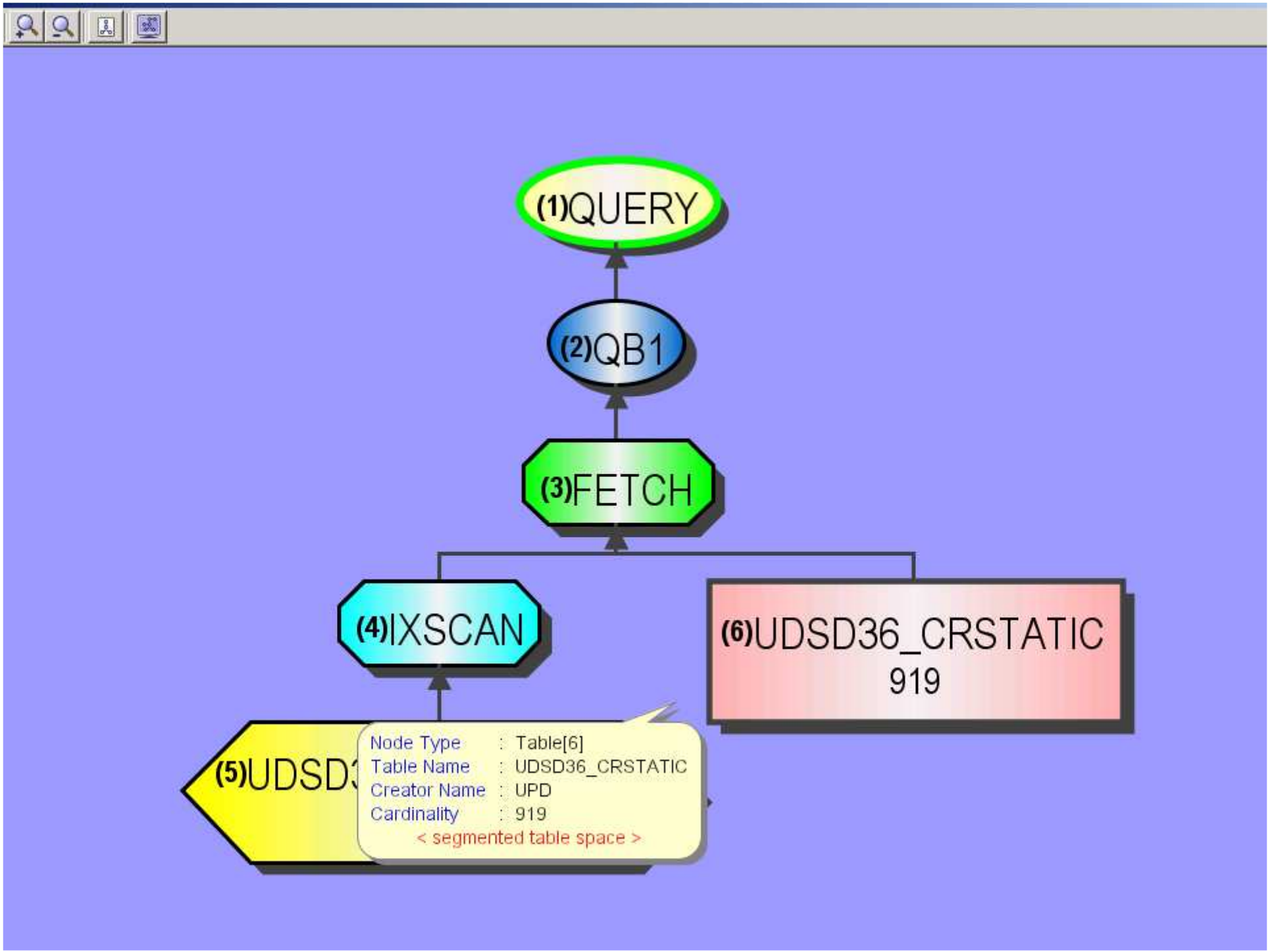
JN DATA

- Strobe/Istrobe implemented
- Education in 2 days (Tell us favourite job in advance)
- Day 1
  - Product presentation
  - Try the product live (setup allready done)
- Day 2
  - Open forum discussion about lessons learned
  - Walk Thru favourite jobs
  - Often DB2 issues, but waits etc also shows
  - Calculate savings in money
- Results
  - > 1000 measurements done since june 15th 2004
  - > 800.000 DKK (approx. 110.000 €) saved pr. annum

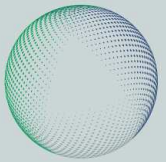

Tune SQL - SDUODB2
File
Access Plan
Selected
Action
View
SQL Text
Access Plan
Execution Result
Report
Statistics Advisor
DB2 Platform: Z/OS DB2 Version: v7 Explain Time: 2004-07-09 12:59:59.706543
query
Show attribute explanation
Views:
Cost estimation
Name
Value
Type
SELECT
CPU Cost (ms)
1
CPU Cost (su)
1
Cost Category
A
Reason
Timestamp
2004-07-09 12:59:59.706543
Attribute explanation:
Type: Query type (SELECT, INSERT, UPDATE, DELETE, SELUPD, DELCUR, UPDCUR)
Save As...
Print...
Suggestions
Help
QUERY
QB1
FETCH
XSCAN
UDSD36_CRSTATIC
919
UDSD36_CRSTATIC_X1
971
Query Block 1


(1)QUERY
(2)QB1
(3)FETCH
(4)IXSCAN
(5)UDSD36_CRSTATIC_X1
971
(6)UDSD36_CRSTATIC
919


(1)QUERY
(2)QB1
(3)FETCH
(4)IXSCAN
(5)UDSD36_CRSTATIC_X1
971
Node Type : Index[5]
Table Name : UDSD36_CRSTATIC
Index Name : UDSD36_CRSTATIC_X1
Creator Name : UPD
Fullkeycard : 971
Cluster Ratio : 0,7765
< primary index >
IC


(1)QUERY
(2)QB1
(3)FETCH
(4)IXSCAN
(6)UDSD36_CRSTATIC
919
(5)UDSD
Node Type : Table[6]
Table Name : UDSD36_CRSTATIC
Creator Name : UPD
Cardinality : 919
< segmented table space >

GSE Nordic Technical Conference



JN DATA

- Featuring DB2, CICS, IMS and MQ
- Developer Track added (Cobol/CICS/MQ/DB2), Hints and tips, XML etc,
- Architecture/general interest track added (Web services, SOA etc)
- Less Sysprog/DBA
- More Developers
- Networking important

- **www.gse-nordic.org**

Questions ??

JN DATA